

## Claims

- [c1] 1. A linear guiding mechanism for an optical scanner, the optical scanner comprising:  
a casing having a hollow center;  
a driving system installed within the casing, wherein the driving system at least includes a driving belt; and  
an optical system within the casing, wherein the optical system at least includes a carrier chassis and a clamping structure, the clamping structure is attached to the carrier chassis, and clamped onto a portion of the driving belt;  
the linear guiding mechanism comprising:  
a V-shaped track positioned inside the casing in the same direction as the travel path of the carrier chassis, wherein the upper section of the V-shaped track includes a pair of support surfaces, the support surfaces extend in a direction parallel to the longitudinal direction of the V-shaped track, and the support surfaces form an included angle; and  
a positioning wheel attached to the carrier chassis, wherein the positioning wheel is supported by the support surfaces on the V-shaped track, and the axis of the positioning wheel is perpendicular to the longitudinal direction of the V-shaped track.
- [c2] 2. The linear guiding mechanism of claim 1, wherein the V-shaped track and the casing are formed together as an integrative unit.
- [c3] 3. The linear guiding mechanism of claim 1, wherein the V-shaped track is fabricated using two monorails with each monorail having a support surface at its upper section.
- [c4] 4. The linear guiding mechanism of claim 3, wherein at least a portion of the driving belt is enclosed within the space between the two monorails.
- [c5] 5. The linear guiding mechanism of claim 3, wherein the clamping structure protrudes into the space between the monorails.
- [c6] 6. The linear guiding mechanism of claim 3, wherein the monorails are attached to the interior sidewall of the casing to form an integrative unit.

[c7] 7. The linear guiding mechanism of claim 1, wherein the optical scanner further includes a positioning structure attached to the interior sidewall of the casing to serve as a retainer for the carrier chassis.

[c8] 8. The linear guiding mechanism of claim 1, wherein the positioning structure is attached to the interior sidewall of the casing to form an integrative unit.

[c9] 9. A linear guiding mechanism for an optical scanner, the optical scanner comprising of:  
a casing having a central hollow space;  
a driving system within the casing, wherein the driving system at least includes a driving belt; and  
an optical system within the casing, wherein the optical system at least includes a carrier chassis and a clamping structure, wherein the clamping structure is attached to the carrier chassis and clamped onto a portion of the driving belt;  
the linear guiding mechanism comprising:  
a V-shaped track positioned inside the casing in the same direction as the travel path of the carrier chassis, wherein the upper section of the V-shaped track includes a pair of support surfaces, the support surfaces extend in a direction parallel to the longitudinal direction of the V-shaped track, and the support surfaces form an included angle; and  
a positioning bump attached to the carrier chassis, wherein a pair of protruding edges on the positioning bump are supported by the support surfaces on the V-shaped track.

[c10] 10. The linear guiding mechanism of claim 9, wherein the positioning bump and the carrier chassis are formed together as an integrative unit.

[c11] 11. The linear guiding mechanism of claim 9, wherein the V-shaped track is attached to the interior sidewall of the casing to form an integrated unit.

[c12] 12. The linear guiding mechanism of claim 9, wherein the V-shaped track is fabricated using two monorails with each monorail having a support surface at its upper section.

[c13] 13. The linear guiding mechanism of claim 12, wherein at least a portion of the

driving belt is enclosed within the space between the two monorails.

[c14] 14. The linear guiding mechanism of claim 12, wherein the clamping structure protrudes into the space between the monorails.

[c15] 15. The linear guiding mechanism of claim 12, wherein the monorails are attached to the interior sidewall of the casing to form an integrative unit.

[c16] 16. The linear guiding mechanism of claim 9, wherein the optical scanner further includes a positioning structure attached to the interior sidewall of the casing to serve as a retainer for the carrier chassis.

[c17] 17. The linear guiding mechanism of claim 16, wherein the positioning structure is attached to the interior sidewall of the casing to form an integrative unit.